Characteristics and Validation of HIRDLS Water Vapor Retrievals

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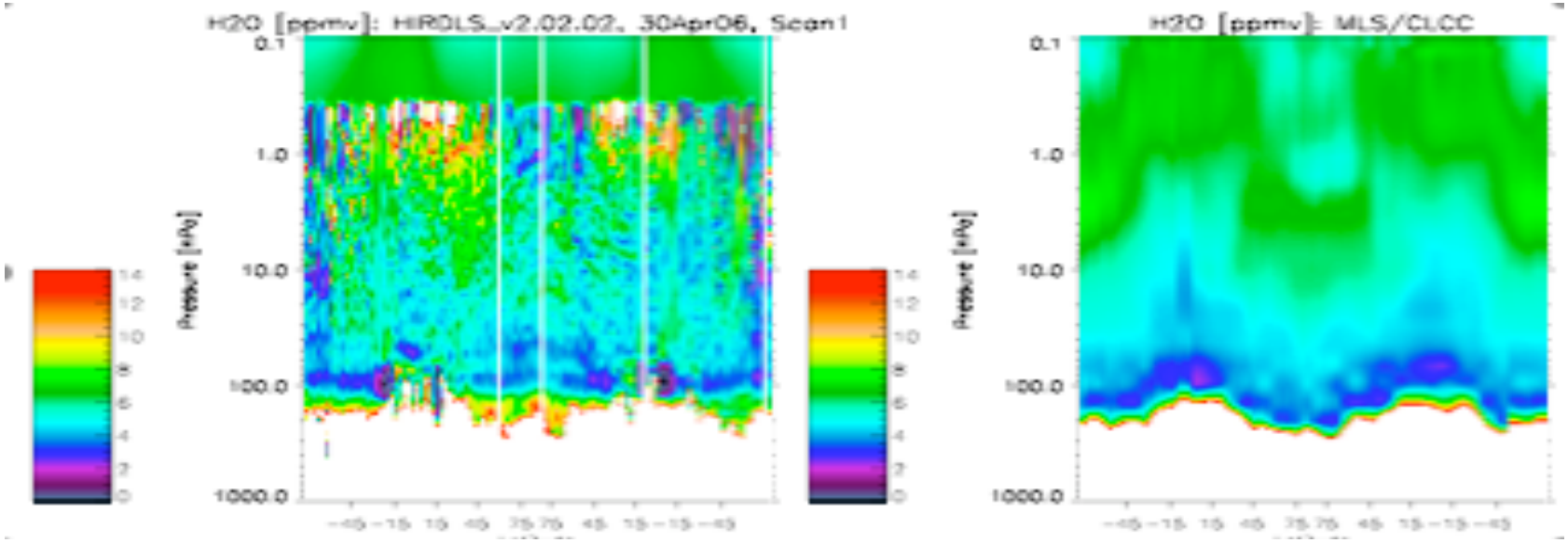
Some Caveats

Water vapor results very sensitive to oscillation perturbations

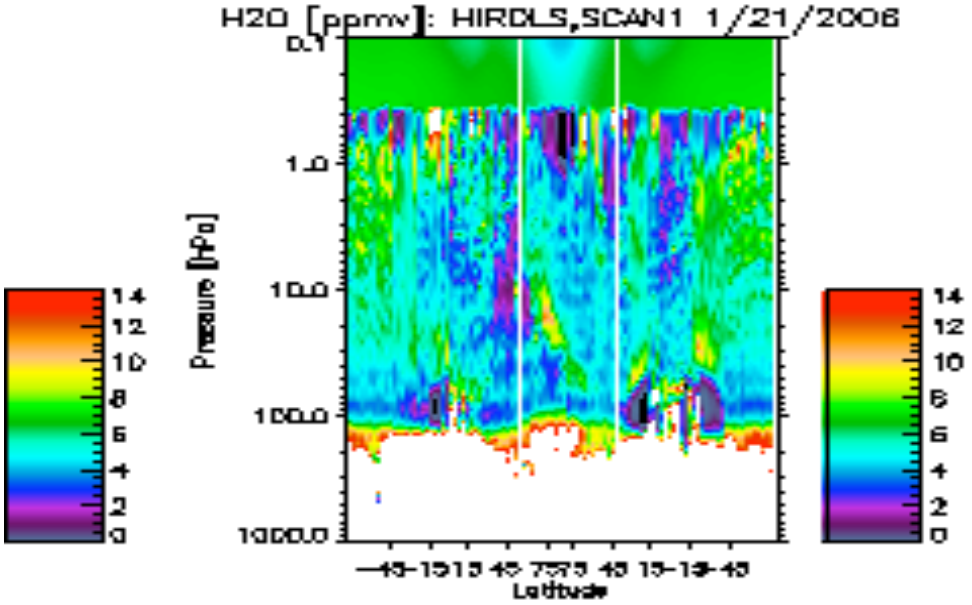
Most effective versions of the "Deoscillation" algorithms are very new

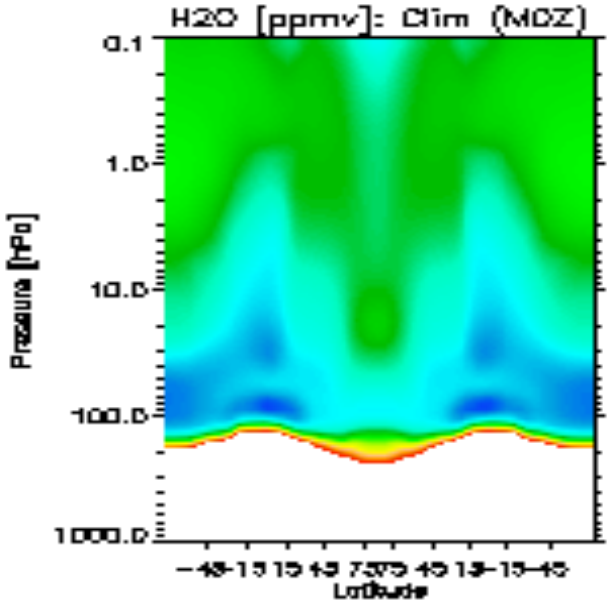
Useful water vapor results are also quite new, so not much time to study in detail. These are first looks.

Water Vapor Orbit Plot
30 April 2006 (Scan Table 22)

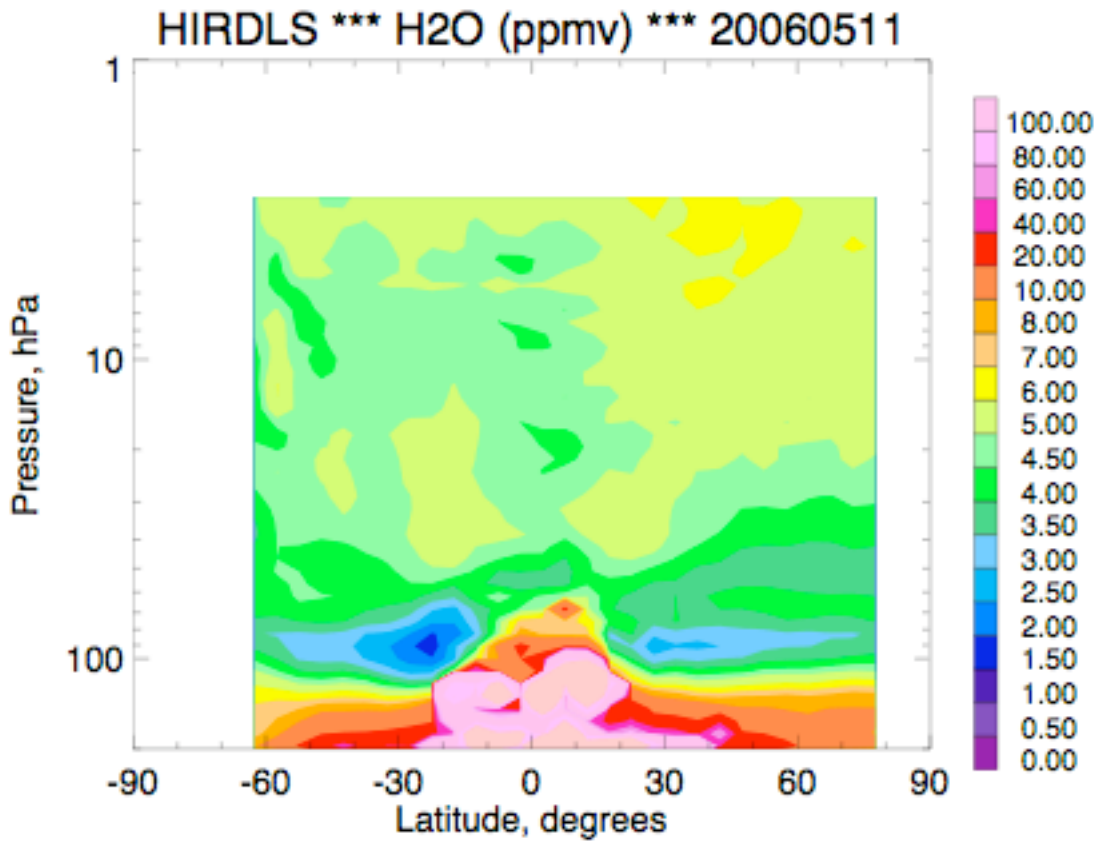


Water Vapor Orbit Plot
21 January 2006 (Scan Table 13)

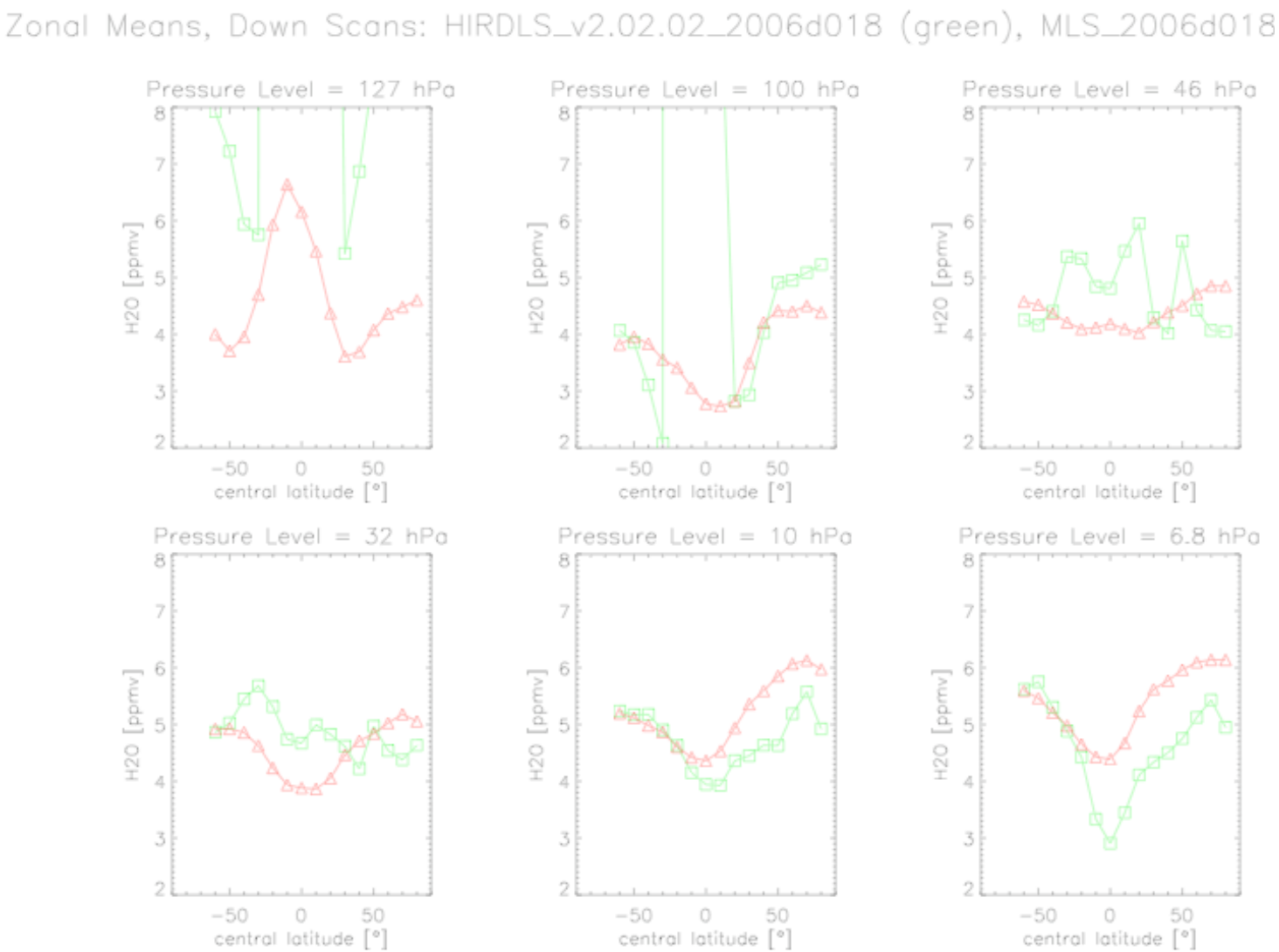




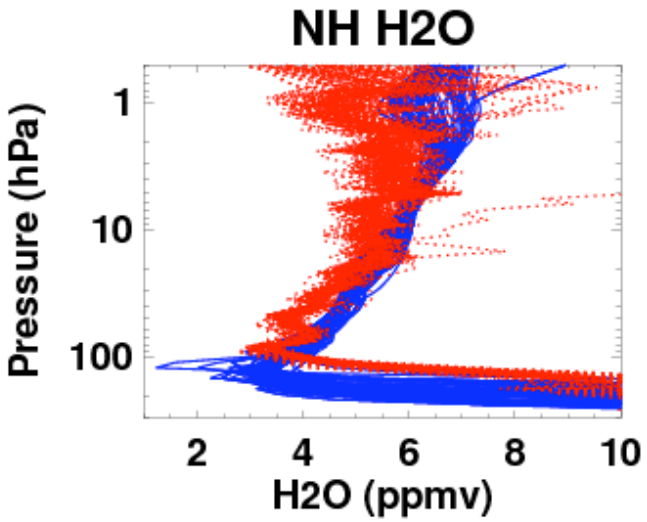
Zonal Mean Water Vapor



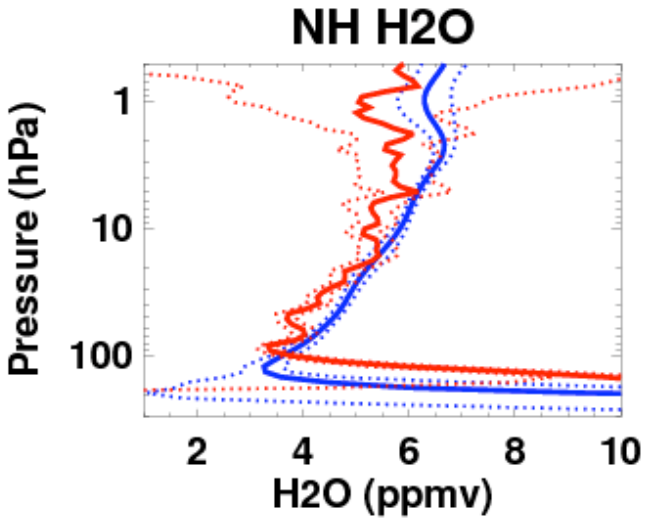
Water Vapor Zonal Means at 6 levels
18 January 2006



HIRDLS & ACE Water Vapor Profiles



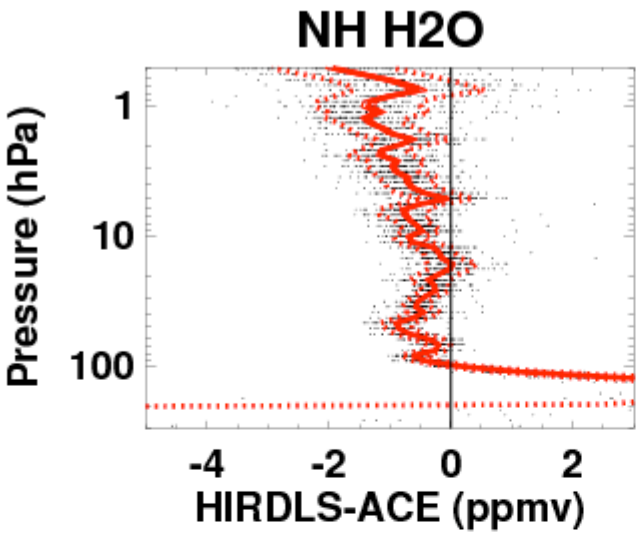
All Coincidences Within 2 hours

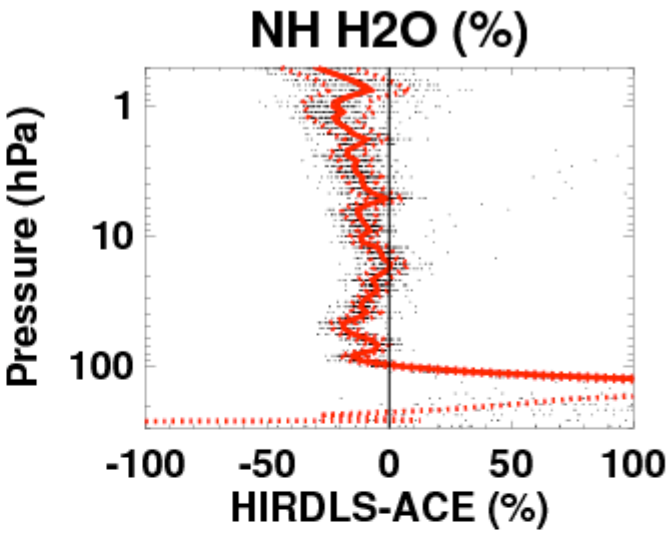


Average (solid) & 1-σ standard deviation (dotted)

Cora Randall, Peter Bernath and the ACE Team

HIRDLS-ACE Water Vapor Differences





Thick red:
Average

Dotted red:
1-σ distribution

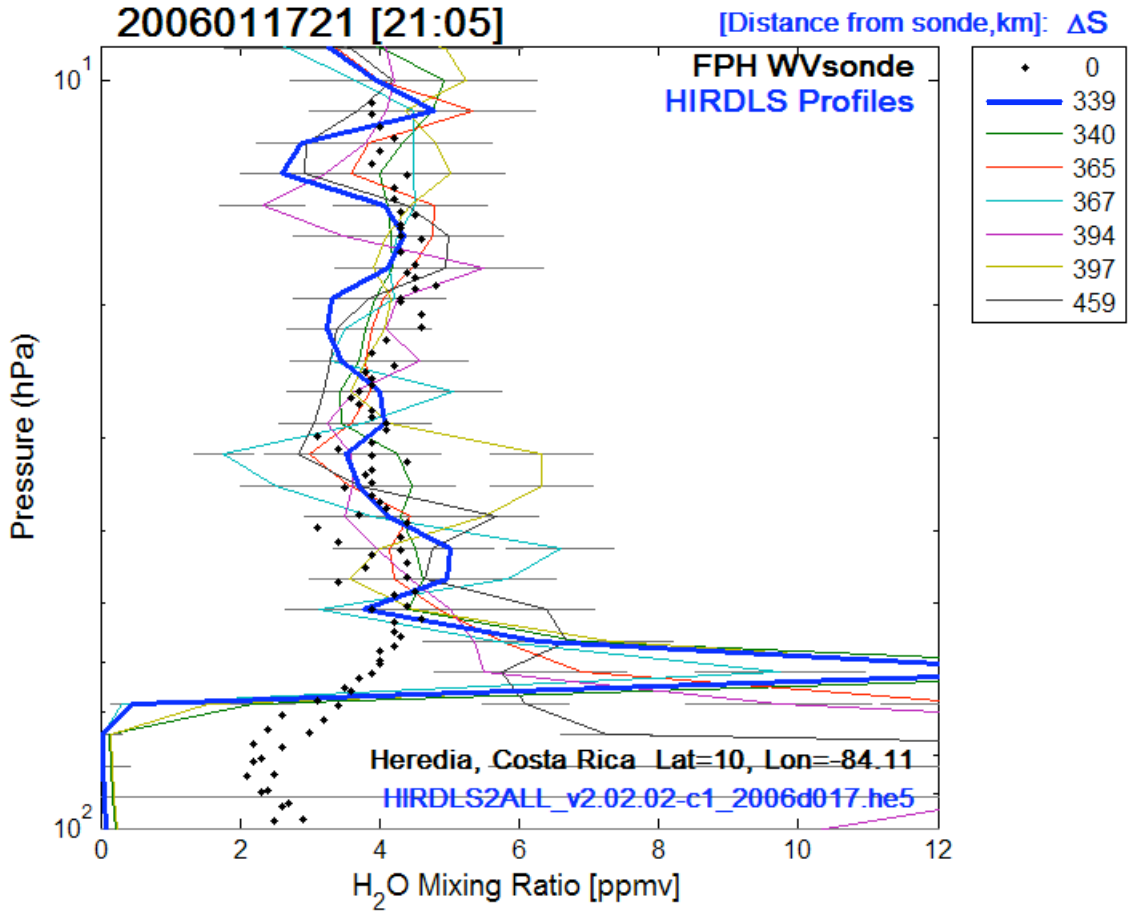
Thin red:
1-σ uncertainty (often hidden)

Black points:
Individual differences

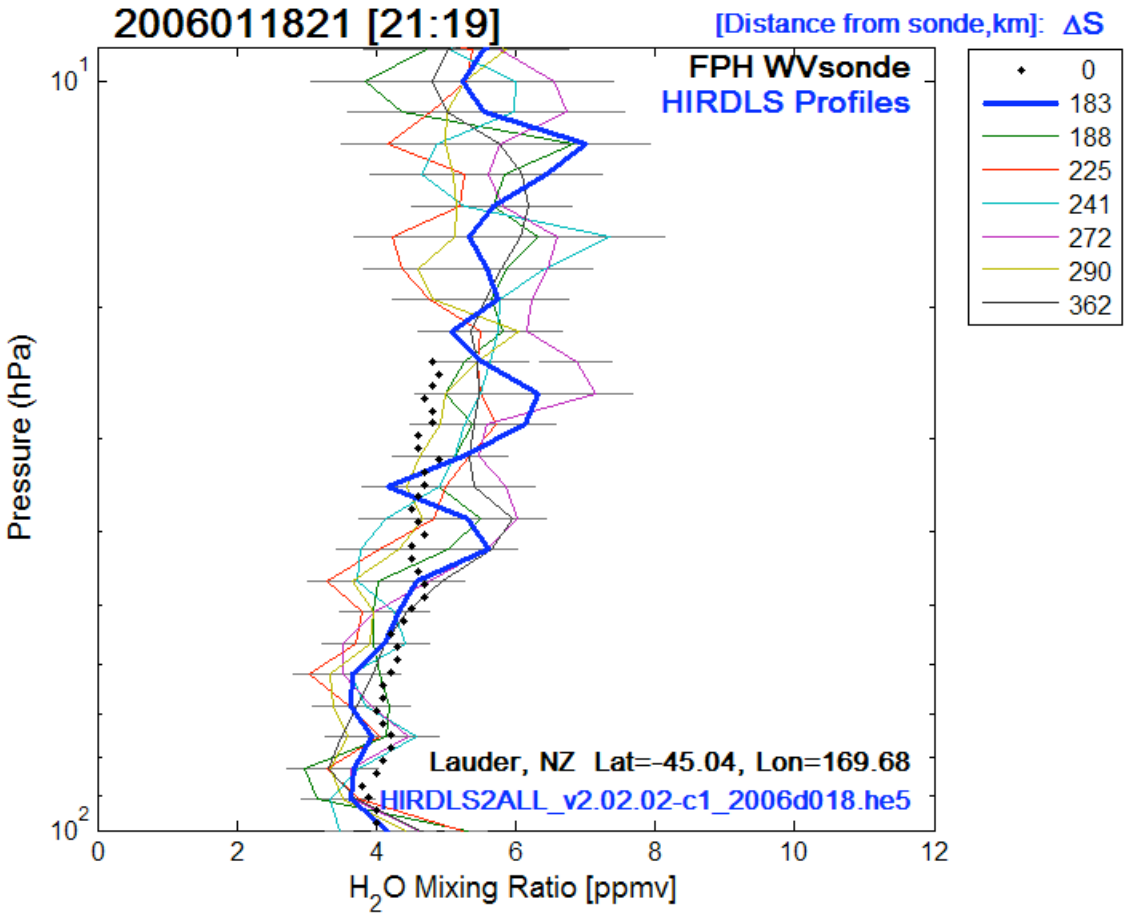
Note: ACE is 0-10% high compared to HALOE

Cora Randall, Peter Bernath and the ACE Team

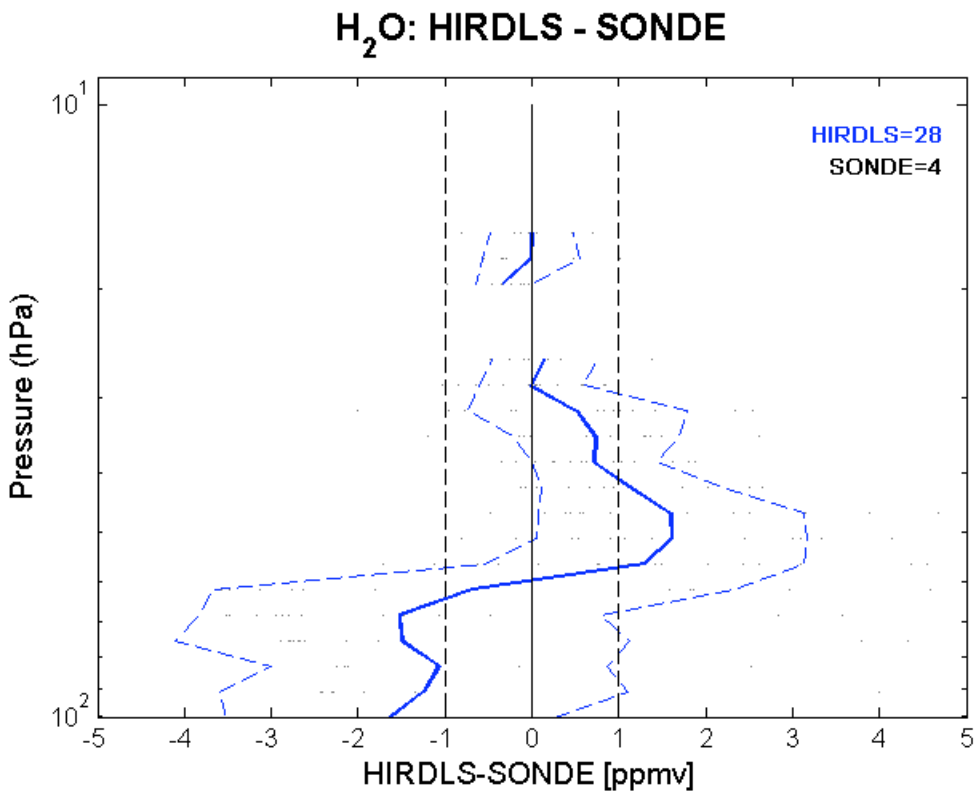
Sonde Comparison- Heredia Costa Rica



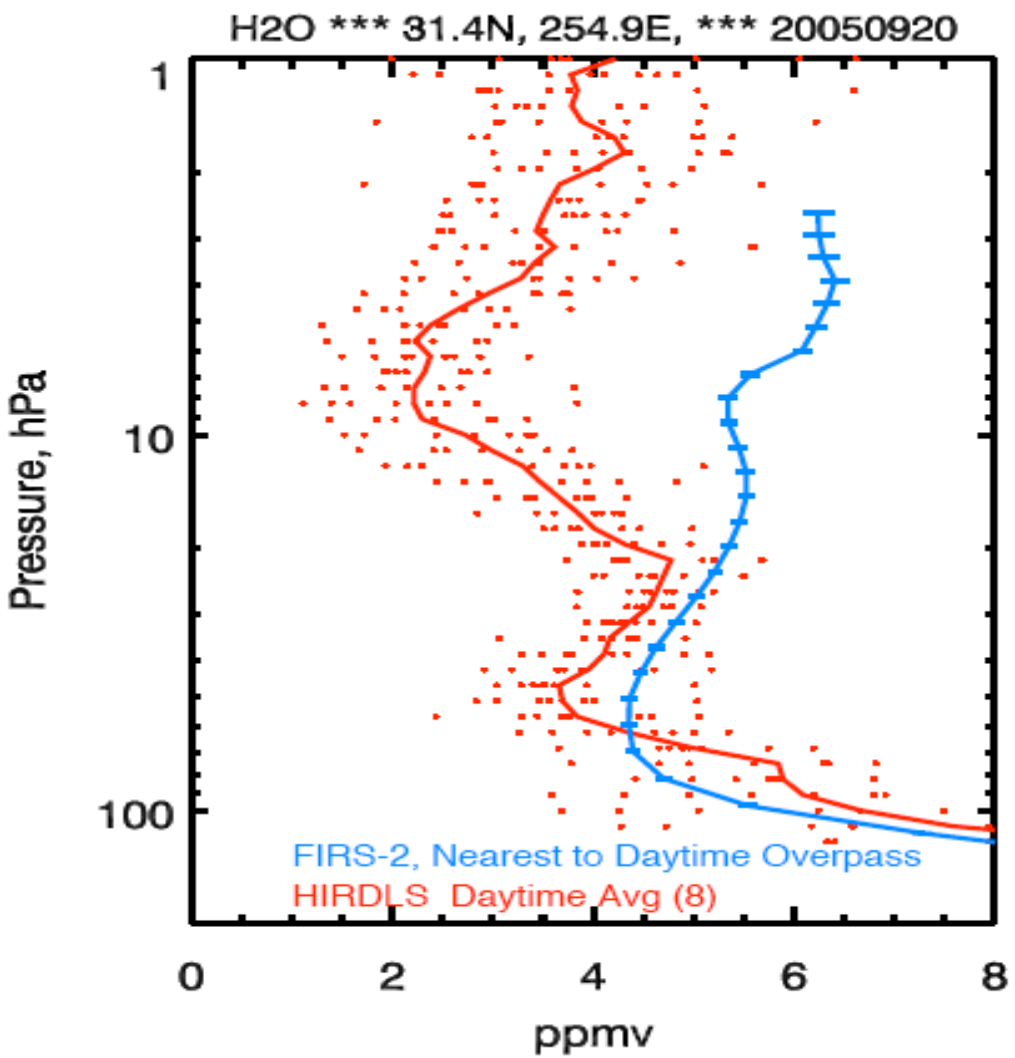
Sonde Comparison- Lauder NZ



Statistics of Sonde Comparisons



HIRDLS vs FIRS-2



- September 20, 2005
  - 31.4 N latitude
  - 255 E longitude.
- Coincidence is within 5° longitude and 2° latitude.
- 8 HIRDLS profiles
- Daytime overpasses for HIRDLS
- Preliminary FIRS-2 data (Ken Jucks).

Summary

Water vapor cross-section and zonal means have reasonable values

Some evidence of residual oscillation for some scan tables (refine)

Values too high in tropics above the tropopause (blockage correction)

Problems-

- **Small scale horizontal variability**
- **Small scale vertical variability**
- **Possible problems at high latitude, high altitude**

Data are clearly on the right track, much further refinement is needed.